

CHAPTER 2

SAMPLING

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ATTACHMENT - FGIS-992, "SERVICES PERFORMED REPORT"

2.1 GENERAL INFORMATION

- a. Representative Sampling.
 - (1) Obtaining a representative sample from a commodity lot is one of the most important parts of inspection.
 - (2) A careful analysis of the sample sent to a testing laboratory will not reflect the true quality of the commodity unless a representative sample is taken. It is the responsibility of the sampler to be sure the sample obtained reflects the true quality of the entire lot.
- b. Types of Sampling Services. Applicants may select online or stationary-lot inspection service. Online inspection is the inspection of a lot as the lot is being produced. Stationary-lot inspection is the inspection of a finished lot when all the containers are stacked in a stationary place (warehouse floor, etc.) or loaded into a carrier.
- c. Alternative Procedures.
 - (1) When inspecting a product for compliance with a contract and the contract specifies sampling procedures other than those provided in this chapter, the sampler must perform the sampling in accordance with the contractual requirements. For example, some Defense Personnel Support Center (DPSC) contracts require sampling using Military Standard 105, Sampling For Attributes, rather than the procedures outlined in this chapter.
 - (2) Some Farm Service Agency (FSA) products require bacteriological testing which requires detailed sampling procedures. Chapter 3 outlines these instructions.
- d. Lot Accessibility.
 - (1) Each lot for which an inspection service is requested should be placed, by the applicant, in such a manner as to permit the safe and proper performance of the service requested.

- (2) If the entire lot is not accessible to perform the service requested or the lot is stacked in a manner that does not provide a safe area to perform the service and is not corrected, the sampler must advise the applicant that the requested inspection cannot be performed or that a partial inspection will be performed.
- e. Plant Examination. Sanitation inspections performed for applicants requesting quality inspections are performed before a plant begins producing a product and on a periodic basis as outlined in the Sanitation Inspection Handbook. Sanitation inspections are requested by the applicant or required by the contract.
- (1) In addition to these inspections, samplers must be constantly alert to make sure that the commodity is packaged under sanitary conditions during the entire day.
 - (2) Any condition that is not sanitary shall be pointed out to the plant supervisor for immediate correction.
 - (3) A notation shall also be made on the FGIS-992, Services Performed Report. (See section 2.13 and attachment.)
 - (4) If the insanitary condition is not corrected, the sampler shall contact the field office manager or cooperator manager.
 - (5) The manager, in turn, will determine if conditional withholding of service is warranted and, if so, is responsible for notifying the applicant in accordance with FGIS Program Directive 910.3, Withholding and Withdrawal of AMA Inspection Services.
- f. General Sampling Principles. The following is a partial list of general sampling principles to remember when sampling.
- (1) Use equipment approved for the product being sampled (see appendix A, Equipment Handbook).
 - (2) Use sampling equipment that is clean and free of any material that might affect the sample.
 - (3) Open each container with a minimum of tearing and cutting, but the opening shall be large enough to allow the drawing of a representative sample.

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- (4) Draw each sample in such a way as to prevent contamination or adulteration of the sample by threads, pieces of paper, or any other materials from the container that are not part of the contents.
- (5) Ensure that an equal amount of sample is obtained from each container selected for sampling or time interval so that each subsample obtained is proportional to the portion of the lot represented by the container selected or time interval.
- (6) Transfer the sample from the sampling device to a moisture-proof container as rapidly as possible with a minimum of exposure to the air.
- (7) Follow all safety and sanitation rules in effect at the plant or warehouse.

g. Reportable Incidents/Conditions.

- (1) During sampling, notify the field office manager or cooperator manager of any unusual incidents or conditions occurring at the plant or when confronted with a problem or situation for which there are no instructions.
- (2) A partial list of incidents or conditions that may develop while performing inspection services which must be reported are:
 - (a) Applicant suggests ways to sample other than the official method.
 - (b) Applicant will not make selected containers accessible for sampling or examination.
 - (c) Applicant offers special favors or gratuities either directly or indirectly.
 - (d) Applicant wants to add containers to the lot after sampling is completed.

- (e) Sampler suspects, for any reason, that a substitution of commodities has occurred or that the commodity shipped was not the commodity sampled.
 - (f) Product was contaminated or adulterated in any manner.
 - (g) Plant is insanitary or product is maintained in an insanitary manner, and applicant refuses to correct the conditions in accordance with requests.
 - (h) Conditions exist that would prevent sampling in a safe manner.
- (3) Incidents involving violations of the Agricultural Marketing Act (AMA), bribery, or other violation, must be reported by following the instructions in FGIS Directive 366.1, "Reporting Violations of the U.S. Grain Standards Act and the Agricultural Marketing Act of 1946."

h. Conserving Time and Effort.

- (1) When applicants request that more than one kind of service (sampling, checkweighing, condition of container examination, etc.) be performed at the same time, use the same containers for all services whenever possible.
- (2) Make the first selection for the kind of service having the largest sample size using the specified selection procedures and use these containers for the other services. For example, individual containers selected for the condition of container examination can be used for checkweighing and for obtaining sample portions for analysis.

2.2 LOT SIZE

a. Maximum Lot Sizes.

- (1) The following maximum lot sizes have been established for processed commodities:

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Table No. 1

MAXIMUM LOT SIZES	
PRODUCT	MAXIMUM LOT SIZE
Dry Corn, Oat, Rice, Soybean, Sorghum, and Wheat Products	500,000 lbs. (225,000 kg.)
Vegetable Oil, Shortening, and Syrup	80,000 primary containers or one truck or railcar for bulk product
Pasta and Margarine	150,000 lbs. (67,500 kg.)
Products Containing Milk	180,000 lbs. (81,000 kg.)

- (2) If the lot exceeds the maximum lot size, inform the applicant that the lot will have to be divided into smaller lots that do not exceed the maximum lot size.
- b. Establishing Lot Sizes.
- (1) The applicant, together with official personnel, must establish, for each lot, the total weight in pounds/kilograms, the total number of containers, and the estimated production time as applicable. Do this before:
 - (a) Production begins when the applicant requests online inspection.
 - (b) Sampling begins when the applicant requests stationary-lot inspection.
 - (2) Inform applicants that, if the lot size changes after sampling begins, additional sample portions and inspection data might have to be obtained from the lot due to changes in sampling rates based on the lot size.

2.3 SAMPLE RATES

Table 2 shows, by product, the number of individual containers or the time intervals to use for obtaining sample portions.

Table No. 2

SAMPLE RATES			
PRODUCT	LOT SIZE IN POUNDS	LOT SIZE IN KILOGRAMS	NUMBER OF CONTAINERS OR TIME INTERVALS PER LOT
Dry Corn, Oats, Rice, Soybeans, Sorghum & Wheat Products	45,000 or less	20,250 or less	12
	45,001 - 180,000	20,251 - 81,000	20
	180,001 - 500,000	81,001 - 225,000	35
Pasta Products	45,000 or less	20,250 or less	18
	45,001 - 80,000	20,251 - 36,000	36
	80,001 - 150,000	36,001 - 67,500	54
LOT SIZE BY PRIMARY CONTAINER			
Vegetable Oil, Shortening, and Margarine in Other than 55- gallon (208.20 liter) Containers	6,000 or less		9
	6,001 - 12,000		10
	12,001 - 36,000		14
	36,001 - 80,000		19
Vegetable Oil, Shortening, and Margarine in 55-gallon (208.20 liter) Containers	500 or less		18
	501 - 1,100		20
	1,101 - 3,300		28
	3,301 - 80,000		38
Syrup	80,000 or less		18

When sampling products not included in table 2, use the square root of the number of containers in the lot as the sampling rate.

2.4 SAMPLE SIZE

Tables 3 and 4 show, by product, the minimum composite sample size and the subsample distribution in pounds/kilograms and quarts/liters.

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Table No. 3

DRY PRODUCTS				
Product	Minimum Composite Sample Size		Subsamples Per Lot ^{1/}	
	Pounds	Kilograms	Pounds	Kilograms
Bakers Soft Wheat Flour	9	4.05	3	1.35
Bakery Mix	9	4.05	3	1.35
Bulgur	5¼	2.36	1¾	0.79
Corn Grits	3	1.35	1	0.45
Cornmeal	3	1.35	1	0.45
Corn Soy Blend	5¼	2.36	1¾	0.79
Corn-Soya Milk	3	1.35	1	0.45
Farina	3	1.35	1	0.45
Instant Corn Masa Flour	3	1.35	1	0.45
Instant Corn-Soya Masa Flour	9	4.05	3	1.35
Instant Corn-Soya Milk	3	1.35	1	0.45
Instant Rice Cereal	3	1.35	1	0.45
Pasta	9	4.05	3	1.35
Rolled Oats	5¼	2.36	1¾	0.79
Rolled Wheat	5¼	2.36	1¾	0.79
Soy-Fortified Cornmeal	3	1.35	1	0.45
Soy Flour, Defatted	3	1.35	1	0.45
Soy Flour, Full Fat	3	1.35	1	0.45
Soy-Fortified Bread Flour	30	13.5	10	4.5
Soy Fortified Bulgur	3	1.35	1	0.45
Soy-Fortified Rolled Oats	5¼	2.36	1¾	0.79
Soy-Fortified Sorghum Grits	3	1.35	1	0.45
Wheat-Soy Blend	3	1.35	1	0.45
Wheat-Soy Milk	3	1.35	1	0.45
Other Flour and Dry Products	3	1.35	1	0.45
^{1/} 1 subsample to CTL, Kansas City, MO. 1 subsample for plant or field office as a reserve sample 1 subsample for the applicant if requested				

Table No. 4

LIQUID AND SEMISOLID PRODUCTS				
	Minimum Composite Sample Size		Subsamples Per Lot ^{1/}	
Product	Quarts	Liters	Quarts	Liters
Margarine	3	2.85	1	0.95
Shortening	3	2.85	1	0.95
Syrup	3	2.85	1	0.95
Vegetable Oil	3	2.85	1	0.95
^{1/} 1 subsample to CTL, Kansas City, MO. 1 subsample for plant or field office as a reserve sample. 1 subsample for the applicant if requested.				

*

For liquid and semisolid products, in the absence of specific instructions in table 4, obtain approximately 3 quarts (2.85 liters) of a fully refined liquid product and approximately 3 gallons (11.4 liters) of an unrefined liquid product for the composite sample. Mix the liquid composite sample well and divide into three equal portions, one for the testing laboratory, one for the reserve sample, and one for the applicant.

2.5 ONLINE INSPECTION

a. Packaged Commodities.

- (1) During online inspection of packaged products, check empty containers for cleanliness throughout the shift.
 - (a) Visually check interiors of containers for rust, dust, and other foreign material. Containers that are not clean must not be filled and included in the lot.
 - (b) If unclean containers are not removed from the lot, note this fact on the FGIS-992 and issue a noncompliance certificate.
- (2) Select the individual containers to use for obtaining sample portions as follows:
 - (a) Determine the number of containers to be produced and the lot weight if necessary.

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- (b) Determine the sample rate by dividing the number of containers in the lot by the appropriate sample size (see table 2).

For example:

Lot size = 120,000 lbs. (54,000 kg.) of wheat flour
packaged in 2,400, 50-lb. (22.5-kg.) bags

Required sample size = 20 containers

$2,400 \div 20 = 120$ container groups

This means that the lot contains 20, 120 container groups and that the sample rate is 1 container for approximately every 120 containers.

- (3) Deliberately vary the containers selected within the groups; do not select, for example, every 120th container.
- (a) To do this, preselect the containers ahead of time using a reference point.
 - (b) For example, select ahead of time the sixth filled container after the one that the machine operator is filling at the time of selection.
 - (c) Use a different preselection number for each container.
 - (d) A sample may be taken near the end of one interval and near the beginning or middle of the next. In other words, vary the time of drawing each sample portion within the time interval so that it is impossible for the applicant to determine when the next sample portion will be drawn. Take the same amount of sample at each time interval.

(4) Sampling Dry Products. When sampling dry products, make the first selection from the first five containers filled at the start of the day's production and from the first five containers filled when production resumes after any production stoppage exceeding 30 consecutive minutes.

(5) Sampling Liquid Products.

- (a) When sampling liquid products, such as oil and syrup, and the sample is taken from a filled container, agitate the container so that sediment or foreign material (if present) will be included in the composite sample. This may be accomplished by vigorously shaking the filled container immediately prior to pouring the sample from the container.
- (b) If liquid products are poured from one container to another, thoroughly clean the pouring spout or the lip over which it is poured before pouring.
- (c) Examine the first container filled when filling operations start at the beginning of the day and after line stoppages, such as for lunch, coffee breaks, or mechanical breakdowns.
- (d) If water, sediment, or other undesirable material is found, the plant supervisor shall remove all containers from the line which are similarly affected and dispose of the commodity so it is not included in the lot.

NOTE: **During online inspection, sample oil, shortening, or margarine immediately prior to or immediately after the filling of containers.**

b. Bulk Commodities. Perform a stowage examination on the bulk carrier before loading.

- (1) Determine the time periods (in minutes) to use for obtaining sample portions as follows:
 - (a) Determine the lot size and sample rate (see table 2).
 - (b) Obtain the estimated loading time in minutes.

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- (c) Divide the estimated loading time by the number of time intervals. This gives the duration of each period in minutes. Take a sample portion during each time period. For example:

Weight of flour to be loaded in hopper car = 100,000 lbs
(45,000 kg.)

Estimated loading time = 240 minutes

Number of time intervals = 20 (see table 2)

$240 \div 20 = 12\text{-minute periods}$

Cut the running commodity stream at least once, at random, during each of the 20, 12-consecutive minute periods, using the appropriate sampling device to provide 20 sample portions.

- c. 88-Hour Rule. When inspection is online and the applicant stops production for more than 88 consecutive hours, sampling cannot resume on the lot.

If production stops during online inspection for more than 88 consecutive hours, the applicant has two options:

- (1) The lot size may be changed to reflect the amount produced, and all subsequent containers produced shall be considered another lot and inspected separately. If this option is selected, determine if the proper amount of sample has been taken to represent the lot. If not, randomly sample additional containers to obtain sufficient sample and complete the inspection.
- (2) The applicant may elect to withdraw the request for online inspection on the portion of the lot that has been produced and request that this lot be combined with an additional portion produced after the production stoppage. If this option is requested, discard the sample from the initial portion of the lot and resample as a warehouse lot after the additional portion is added.

2.6 STATIONARY-LOT INSPECTION

- a. Packaged Commodities At Rest In Plants and Warehouses. Select the individual containers to use for obtaining sample portions as follows:
- (1) Determine the number of containers in the lot and the lot weight.
 - (2) Determine the sample rate (see table 2).
 - (3) For a nonpalletized lot, select the containers.
 - (4) For a palletized lot, select the pallets first. The number selected must equal the required sample size for the lot. Then select one container from each pallet.

For example:

Lot size = 120,000 lbs. (54,000 kg.) of cereal consisting of
10,000 cases; 12, 1-lb. (0.45 kg.) boxes per shipping case =
250 pallets; 40 cases per pallet

Sample size = 20 boxes.

Select 20 pallets.

Select 20 shipping cases, one from each pallet.

Select 20 boxes, one from each shipping case.

Take a sample portion from each box.

If the number of pallets in the lot is less than the sample size,
obtain the containers from all of the pallets.

For example: To obtain 20 containers from 15 pallets:

Select 10 pallets and draw 1 container from each pallet.

Draw 2 containers from each of the other 5 pallets.

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b. Packed Commodities At Rest In Carriers.

- (1) Sampling in railcars and trucks presents specific safety concerns. All necessary precautions must be taken when sampling under these conditions. Report all unsafe conditions to the field office manager for resolution.
- (2) The containers in the carrier are considered accessible for inspection when three wells are dug at the location and depth selected by the sampler. Labor and equipment for making the commodity accessible is furnished by the applicant.
- (3) Randomly select the location of the three wells and containers to be sampled. The use of selection cards are not required. However, selection cards may be used as a tool to determine the location of the wells and containers to be sampled. If selection cards are used, proceed as follows:

Make up selection cards at the field office, using six regular 3" x 5" cards typed as shown below.

Card #1

A1	A2	D	B1	B2
3	1	6	1	3
2	3		3	2
1	2	5	2	1

Card #2

A1	A2	D	B1	B2
2	3	5	3	2
1	2		2	1
3	1	6	1	3

Card #3

A1	A2	D	B1	B2
1	2	6	2	1
3	1		1	3
2	3	5	3	2

Card #4

A1	A2	D	B1	B2
1	3	5	3	1
2	1		1	2
3	2	6	2	3

Card #5

A1	A2	D	B1	B2
3	2	6	2	3
1	3		3	1
2	1	5	1	2

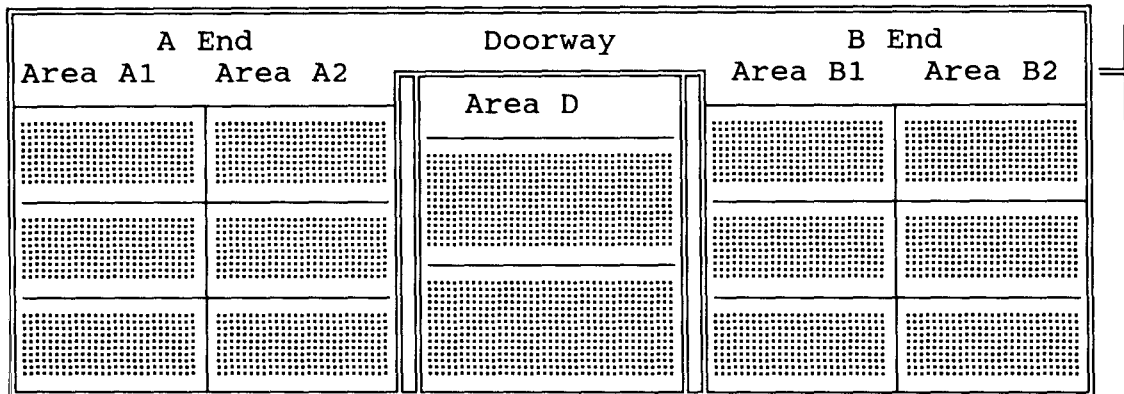
Card #6

A1	A2	D	B1	B2
2	1	5	1	2
3	2		2	3
1	3	6	3	1

The random selection cards identify the general area in a carrier by ends and middle locations (A1, A2, D, B1, B2), the levels within an area (top, middle, bottom), and the number of containers sampled from that area.

(4) Sample the carrier as follows:

- (a) Select a card by shuffling the six cards and drawing one at random.
- (b) Mentally divide the carrier into areas as shown below:



- (c) Select the locations of three wells so that the proper number of containers may be sampled from each section. If using selection cards, select a card by shuffling the six cards and drawing one at random. The selected card states the number of containers to be chosen at random from each section.

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- (d) Sample the number of containers indicated in table 2 at random from the containers removed and from the exposed containers forming the sides of the wells. If inner containers are present, select at random an inner container within the outer container. Determine prior to opening the outer container which of the inner containers will be selected. If using cards, the card will indicate the number of containers to select.
- (e) Examine the condition of the containers as they are sampled to determine if the containers are clean or dirty, stained, torn, or contain live or dead insects. The kind and condition of the containers should be noted on the FGIS-992.
- (f) The following example explains the selection card method of sampling.

Example A: 1/ Card number 1 is drawn from the deck of cards and you decide that one well shall cover area A1, one shall cover areas A2 and D, and one shall cover areas B1 and B2. Sample containers as follows:

A End		Doorway		B End	
Area A1	Area A2	Area D		Area B1	Area B2

Example B: 1/

Card number 1 is drawn from the deck of cards and this time you decide to place the wells in a different pattern. Sample containers as follows:

A End		Doorway		B End	
Area A1	Area A2	Area D		Area B1	Area B2
xx x	x	x x x x x x		x	x x x
x x	x x x	x x x x		xx x	x x
x	x x	x x x x x		x x	x

Example C: 1/

Card number 4 is drawn and containers sampled as follows:

A End		Doorway		B End	
Area A1	Area A2	Area D		Area B1	Area B2
x x	x x x	x x x x		x x x	x
x x	x	x x xx		x	x x
xx x	x x	x x xx xx		x x	xx x

1/ Container locations are shown for illustration purposes only. Use your own judgment as to which containers are to be sampled within the well so that a representative sample is obtained.

The selection cards provide for 35 sample portions. If the size of the lot in the carrier is such that more or less than this number of containers must be sampled as specified in table 2, mentally adjust the numbers on the selected card. For example: A truck lot of 725 containers is to be sampled. Table 2 requires a sample size of 20 containers and you draw card number 5 from the deck of cards. Mentally adjust the numbers on it as follows:

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A1	A2	D	B1	B2
1	2	2	1	1
1	1		2	1
2	1	2	1	2

A variety of other adjustments could be made to card number 5 in the above situation. Another example follows:

A1	A2	D	B1	B2
1	2	3	1	1
1	1		1	1
1	1	3	1	2

c. Bulk Commodities in Hopper Cars, Trucks, Vessels, and Land Tanks.

- (1) Obtain sample portions from each compartment using the appropriate sampling device.
- (2) Obtain approximately the same amount of sample from each compartment and in quantities that will total the amount required in tables 3 or 4.
- (3) When sampling is requested after the carrier has been loaded and the carrier has not been examined for condition prior to loading, a statement to this effect shall be made on the FGIS-992 and the certificate for quality.

2.7 SAMPLING DEVICES

a. Dry Products.

(1) Ladles.

- (a) Polyethylene or stainless steel ladles may be used to obtain sample portions from containers before the containers are closed and from a running commodity stream when plants do not have diverter-type (D/T) mechanical samplers.
- (b) Obtain ladlefuls from and below the product's surface by dipping immediately after the containers are full (after they pass the dribbler, if there is one) and before closing.
- (c) Use a 2-oz. ladle for containers weighing 5 lbs. (2.25 kg.) or less. Use a 4-oz. ladle for containers weighing over 5 lbs.

NOTE: Ladles shall not be used to sample soy-fortified bulgur or soy-fortified sorghum grits. These products must be sampled using a bag trier (see below).

*

- (d) Use only stainless steel ladles for sampling FSA products with bacteriological requirements. See chapter 3 for more information on these products.

(2) Bag Triers.

- (a) Use the type of bag triers listed in table 5 to obtain samples from filled and closed 25-pound and greater capacity primary containers made from paper, woven polypropylene, burlap, and cotton.

Table No. 5

BAG TRIERS	
Product	Trier Type
Powdery Products ^{1/}	Double-Tube Noncompartmented Single-Tube Open-Ended
Nonpowdery Products ^{2/}	Double-Tube Noncompartmented
Soy-Fortified Bulgur Soy-Fortified Sorghum Grits	Double-Tube Compartmented
^{1/} Products, such as flour. ^{2/} Products, such as bulgur, grits, and rolled oats.	

- *
- (b) Use only stainless steel triers for sampling FSA products with bacteriological requirements. See chapter 3 for more information on these products.
 - (c) Use triers that can reach the opposite corner of the containers when inserted on a diagonal, starting from one corner. Obtain sample portions as follows:
 - 1) Lay containers flat (or up on end, if using a double-tube, compartmented trier).
 - 2) Insert the trier in the corner of the container with the slots closed, if a double-tube trier.
 - 3) Move the trier diagonally through the middle of the container until it touches the opposite corner. Avoid puncturing the opposite side or bottom of the container. Then, if it is a single-tube trier, withdraw it. If it is a double-tube trier:
 - a) Open it with the slots facing upward.

- b) Move the trier in and out two or three times to fill the slots.
- c) Close the trier and withdraw it.

(3) PVC Flour Triers.

- (a) Use 10-foot (300-cm) PVC flour triers for sampling flour and similar powdered commodities in hopper cars and trucks.
- (b) Obtain sample portions from the center of each hopper car and truck compartment as follows:
 - 1) Insert the unstoppered trier straight down into the commodity.
 - 2) Insert the stopper in the cap after the trier is filled.
 - 3) Withdraw the filled trier.
 - 4) Remove the stopper to allow the commodity to flow out of the trier.
 - 5) Record the statement "Top ____ sampled, bottom not sampled." on form FGIS-992 when the bottom is not reached by all probes. The number of feet shown in the statement must correspond to the estimated average depth of all probes that did not reach the bottom of the carrier.

(4) D/T Mechanical Samplers.

- (a) Use D/T mechanical samplers to obtain sample portions from running commodity streams.
- (b) Follow the approval and operating procedures for D/T mechanical samplers provided in the Mechanical Sampling Systems Handbook.

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- (c) Set D/T mechanical samplers so that at least the minimum number of portions required in table 2 is obtained and the weight of the sample portions, when combined, is equal to the applicable composite sample weight shown in table 3.
- (d) Secure all diversion points between the sampling location and the carrier before sampling starts.
 - 1) Check all seals and locks just before sampling starts and immediately after sampling ends.
 - 2) Report any seal and lock irregularities to the field office as soon as possible.

NOTE: Some dry products, such as pasta products and cereals, cannot be sampled with the above devices due to their size. For these types of products, pour the entire contents from one primary container into a clean, shallow container. It is a good practice to examine the interior of the emptied primary containers for any abnormalities such as insect webbing or foreign material. Mix macaroni type pasta products gently using an official polyethylene ladle and remove a representative sample portion. Remove a representative portion of spaghetti and noodle products with your gloved hands so as not to break the product.

b. Liquid and Semisolid Products.

(1) Ladles/Spatulas.

- (a) Use ladles or spatulas made of stainless steel, aluminum, or nickel. Avoid using ladles or spatulas made of copper, bronze, or brass because these metals will contaminate liquid and semisolid products such as oil and shortening.

- (b) Use ladles only while the product is being agitated or thoroughly mixed. For example, oil that is coming from a filling machine is considered well mixed, and the sample taken from the container should be representative.
 - (c) Ladles can be used for online sampling of 1-gal. (3.8-L) cans, 5-gal. (19-L) cans, and for drums if the sample is taken as soon as the containers are filled.
 - (d) Loading or unloading serves to physically mix bulk oils. Therefore, dip samples taken at irregular time intervals, during loading or unloading, provide a representative sample of the lot.
 - (e) Use spatulas for sampling semisolid products, such as shortening and margarine.
- (2) Thief Sampler.
- (a) This type sampler is usually used on containers that can be agitated or mixed before inserting the thief.
 - (b) When possible, draw the sample from along the entire length of the container.
 - (c) As soon as the thief sampler is fully inserted, close the upper constriction with a finger and transfer the oil to a suitable container.
- (3) Core or Trier Sampler.
- (a) The core or trier sampler can be used for sampling drums, tankcars, or ships depending on the length of the sampler.
 - (b) Lower the trier vertically through the oil at a uniform rate with the bottom valve completely open.
 - (c) The rate of lowering should be about 1 ft. (30 cm) per second.
 - (d) After the bottom of the container is reached, close the bottom valve and withdraw the sampler.

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(4) Bacon Bomb Sampler.

- (a) This is a stainless steel cylinder with openings at the lower and upper ends. A plunger extends through the cylinder from top to bottom and serves as a valve for both openings.
- (b) Raising the plunger allows the oil to flow in through the lower opening and releases the trapped air through the upper opening.
- (c) The lower end of the plunger protrudes through the bottom of the sampler about 1/2 in. (1.25 cm). There are two common sizes of Bacon bombs, 1-pt. (0.47-L) capacity and 1-qt. (0.95-L) capacity.
- (d) A graduated steel tape is attached to the upper end of the bomb to measure the oil depth and stop the bomb at any desired level. A chain or heavy cord is attached to the plunger and is pulled to lift the plunger and fill the bomb with oil. A tripod device, with a winch, has been developed for lowering and raising the bomb sampler. If required, the temperature of the oil can be obtained by attaching a minimum-maximum thermometer to the sampler.

(5) Curtus-Tompkins Zone Sampler.

- (a) This is a 12-in. (30-cm) tapered cylinder that has flutter valves on each end. The sampler has a weighted bottom so it will pass easily through the oil.
- (b) The flutter valves automatically open as the sampler is lowered into the oil and are closed by the upward movement of the sampler.
- (c) This sampler will take a sample of approximately 1 qt. (0.95 L) of oil.

- (d) A graduated steel tape is attached to the upper end of the cylinder to measure the oil depth and stop the sampler at any desired level. The tripod mentioned for use with the Bacon bomb sampler can also be used with this sampling device.
- (6) Bleeder-Line Sampler. The bleeder-line method of sampling oil can also be used while the oil is being loaded or unloaded. When using this method, remain present for the entire period of loading or unloading.

2.8 CLEANING SAMPLING EQUIPMENT

- a. Clean ladles, bag triers (outside and inside of inner and outer tubes), sample pails and lids, and spoons before sampling each lot and as often after that as necessary.
 - (1) Clean by wiping with clean, dry paper toweling or, when necessary, by washing with soapy water, rinsing with clean water, and thoroughly drying with clean, dry paper towels.
 - (2) Place ladles and spoons in new, clear polyethylene bags immediately after cleaning and keep them there when you are not obtaining sample portions or dividing samples.
- b. PVC Flour Triers. Clean the inside of PVC flour triers as soon as practical after sampling by passing clean, dry, rag toweling through the bore and stoppering both ends. Clean the outside of these triers, if necessary, before and after sampling each lot by wiping with clean, dry toweling.

*

NOTE: FSA products which require bacteriological testing necessitate additional cleaning. See chapter 3 for these procedures.

2.9 EXAMINING AND COMPOSITING SAMPLE PORTIONS

- a. General. A sample portion is the amount of sample obtained from a selected container or during a specified time period.

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- (1) Obtain the same amount of sample (sample portion) from each container or during each time period so that each sample obtained is proportional to the portion of the lot represented by the container or time interval.
 - (2) Immediately after obtaining a sample portion, visually examine it for uniformity in quality before adding it to the composite sample. A sample portion is not uniform when its quality is distinctly different from the quality of the other sample portions obtained for the lot. For example, it contains live or dead insects, foreign material (glass, metal shavings, water, sediment, etc.), color, particle size, or lumps that do not disintegrate easily or is otherwise distinctly different from other sample portions.
 - (a) For D/T mechanical samplers, if you cannot examine a sample portion while it is in the collection box, empty it into a bag and then examine it.
 - (b) For liquid products, pour the sample into a clean, clear container for examination to determine if it should be included in the composite sample.
- b. Distinctly Different Sample Portions. When a sample portion is not uniform, immediately:
- (1) Draw enough additional sample from the same container(s), compartment(s), or time period, as applicable, of the distinctly different commodity to form a "Distinctly Different Sample." The size of the distinctly different sample should equal or exceed that shown in tables 3 or 4 for the composite sample. Place the distinctly different sample portions in a separate sample container from the other sample portions taken from the lot.
- If the lot contains more than one type of nonuniform portion, obtain a distinctly different sample from each portion.

For Example: A lot of yellow corn meal contains one portion that is infested with insects, another portion does not have insects but is white in color, and the remainder of the lot appears normal. Obtain three samples, one distinctly different sample from the portion that contains insects, one distinctly different sample from the portion that appears white, and finally a sample from the normal appearing portion.

(2) Obtain an estimate of the product amount represented by the nonuniform sample portion to be used for certification if necessary.

(a) When performing online inspections, a nonuniform sample portion represents:

- 1) For packaged commodities, all of the commodity packaged since the last good sample portion was obtained unless examination shows otherwise (for example: 120, 50-lb. (2.25-kg) containers).
- 2) For bulk commodities all of the commodity loaded into the carrier since the last good sample portion was obtained (for example: one time period = 1/20th of the 100,000-lb. (45,000-kg) lot (20 time periods for the lot) = 5,000 lbs. (2,250 kg).

(b) When performing stationary-lot inspections, a nonuniform sample portion represents:

- 1) For packaged commodities, the sampled container and all surrounding containers that probably contain nonuniform product. Determine the approximate number of containers holding nonuniform product by sampling containers at intervals in northerly, westerly, southerly, easterly, and in-between directions.
- 2) For bulk commodities in hoppercars and trucks, all the commodity in the sampled compartment or truck.

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- 3) Inform the plant management and the field office manager that you obtained a nonuniform sample portion.
 - a) The field office manager will inform the plant management that the field office will certificate the entire lot as not being in compliance if the portion represented by the nonuniform sample portion is commingled with the remainder of the lot and the "Distinctly Different Sample" does not meet contract requirements.
 - b) If the laboratory analysis indicates that the distinctly different sample and the sample representing the rest of the lot meet contract requirements, issue one certificate showing entire lot to be in compliance.
- c. Compositing Sample Portions. For each lot, immediately after examining sample portions for uniformity, place uniform sample portions in the same sample container to form the "composite sample" and each nonuniform sample portion in a separate sample container.
 - (1) For liquid products, when pouring from one container to the composite container, thoroughly clean the pouring spout before pouring.
 - (2) Once solid portions of shortening or margarine have been taken for a composite, they shall not be melted prior to submission to the laboratory.

2.10 SAMPLE CONTAINERS

- a. General. Samples must always be placed in new, clean containers. Under no circumstances are the samples to be placed in containers which have been used before or which contain any rust, dust, or other foreign matter.
- b. Dry Products.
 - (1) Polyethylene Bags. Place sample portions and subsamples in new, clear polyethylene bags.
 - (a) Keep bags tightly closed except when adding sample portions or dividing samples to prevent outside contamination.
 - (b) Squeeze all of the air out from above the sample portions and subsamples before twisting the bags closed and applying ties.
 - (2) Sample Pails With Lids. During sampling, keep the bag holding the composite sample in a sample pail and keep the sample pail tightly closed with a lid when you are not adding sample portions and mixing and dividing samples.
- c. Semisolid Products. Place sample portions and subsamples in new, clear polyethylene bags.
 - (1) Keep bags tightly closed with twist ties except when adding sample portions or dividing samples.
 - (2) Squeeze all of the air out from above the sample portions and subsamples before twisting the bags closed and applying ties.
- d. Liquid Products. Place sample portions in new clean, containers.
 - (1) Containers used to package the product are acceptable as long as they can be verified as clean.
 - (2) Keep the containers closed except when adding samples to prevent exposure to the air and possible contamination.

2.11 PREPARING AND DISTRIBUTING SUBSAMPLES

a. Dry Products.

- (1) For dry products except rolled oats, rolled wheat, and pasta, mix the composite sample thoroughly by inverting, shaking, and kneading the composite sample bag for at least 2 minutes or thoroughly mixing with a spoon or ladle. *
- (2) Gently mix rolled oats, rolled wheat, and pasta composite samples with a spoon or sampling ladle to thoroughly mix the sample without crushing the product. For items such as lasagna noodles or spaghetti, gently mix the sample with your gloved hands to prevent breakage.
- (3) Immediately after mixing, divide the sample into subsamples with a long-handled plastic or metal spoon. Place the subsample amount shown in table 3 in each of two or three containers as applicable.
- (4) Place the subsample of dry products sent to CTL in new polyethylene bags. The polyethylene bags must be air tight and the tie applied just above the product after the air has been squeezed out to prevent any change in the moisture content.
- (5) For dry products with a laboratory subsample size of less than 2 lbs. (0.9 kg), place the polyethylene bag in the standard cardboard mailing box.
 - (a) To ensure that as much sample as possible is sent to the laboratory, fill the bag so that it completely fills the mailing box.
 - (b) Placing the bag in the box before filling the bag will generally accommodate more sample in the box.

- (c) If the commodity is pasta, rolled wheat, or rolled oats, fill the containers to capacity to protect particle size and prevent any other change in the product. Do not crush the product during filling.
 - (d) Fasten two mailing boxes end to end for mailing spaghetti and lasagna type noodles so that the products can be mailed without breaking. Other mailing containers may be used for these products as long as they accommodate the minimum amount of product and prevent breakage.
 - (6) For dry products with a subsample size of 2 lbs. (0.9 kg) or more, place the polyethylene bag in a mailing bag or box that will protect the sample in shipment.
- b. Semisolid Products (Margarine and Shortening).
- (1) Place shortening sample portions in a polyethylene bag similar to that used for lining 50-lb. cans or fiberboard boxes of shortening.
 - (2) Mix the composite sample thoroughly by kneading the bag for at least 2 minutes.
 - (3) Immediately after mixing, divide the sample into subsamples with stainless steel spoon.
 - (4) Place the subsample amount shown in table 4 in each of two or three containers as applicable.
 - (5) Place semisolid products in new quart jars and fill to capacity to minimize contact of the product with entrapped air. The sample container should be purged with nitrogen, if available, to remove the oxygen from the container prior to filling.
 - (6) Place the quart jar in a styrofoam mailer for shipment to the laboratory. Semisolid products may be sent to the testing laboratory in alternative containers at the applicant's request if the request is made in writing.

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c. Liquid Products.

- (1) For liquid products, the composite sample shall be well mixed by shaking the composite sample.
- (2) Immediately after mixing, divide the sample into subsamples in the amount shown in table 4 and place in each of two or three containers as applicable. When transferring liquid products from the composite container to the subsample container, thoroughly clean the pouring spout before pouring. Samples should be protected from contact with heat and air as much as possible so that the quality of the product is protected.
- (3) Place liquid products in new quart jars and fill to capacity to minimize contact of the product with entrapped air. The sample container should be purged with nitrogen, if available, to remove the oxygen from the container prior to filling.
- (4) Place the quart jars in a styrofoam mailer for shipment to the laboratory. Liquid products may be sent to the testing laboratory in alternative containers at the applicant's request if the request is made in writing.

d. Work Records. For all products, place the laboratory copy of the FGIS-992 in the mailing container along with the sample. Do not place the FGIS-992 inside the sample container.

e. Mailing.

- (1) Fill in the appropriate information on the standard mailing box. If the standard mailing box is not used, place the following information on each sample container (place the information on bags with a permanent marker or on "stick-on" labels and attach the labels to the bags):
 - (a) Contract number.

- (b) Lot number.
- (c) Plant location (city and State).
- (d) Date sampled.
- (2) It is important to mail commodity samples to the testing laboratory as soon as possible after a lot is completed in order to expedite the testing analyses. The field office manager or cooperator is responsible for establishing the best possible mailing procedures.
- (3) If applicants request a delivery service other than the U.S. mail, field office managers may arrange for such service at the applicant's expense.
- (4) Distribute the subsamples as follows:
 - (a) Send one to CTL. CTL will divide the subsample into an original and a file sample.
 - (b) Maintain one in reserve at the plant or field office.
 - (c) Give one to the applicant if the applicant requests one.
- (5) Samples should be kept in the custody of official personnel or protected from manipulation by other persons until they are mailed.
- f. Distinctly Different Samples. For each distinctly different sample, prepare and distribute the subsamples in the same manner as described above except label each subsample "Distinctly Different."

2.12 SAMPLE AND EQUIPMENT SECURITY CABINETS (STORAGE AREAS)

- a. Cabinets shall be placed at plants where inspection service is provided on a regular basis. Their use will prevent any possible tampering with official samples and supplies.

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- b. Store all samples not in the custody of licensed or authorized personnel in the cabinets. For instance, when the sampler leaves the point of sampling for meals, to perform checkloading and related duties, or for any other reason, official samples must be placed in the cabinet. Store equipment and supplies, when not in use, in the same manner.
- c. Cabinets must be:
 - (1) Of sufficient size to contain samples, sampling supplies and equipment, and checkweighing scales.
 - (2) Placed in the immediate work area. Cabinets in basements and other remote areas are not acceptable. (If it is impossible or impracticable to locate the cabinet in the immediate work area, use a portable locked can, such as a galvanized, aluminum or plastic pail, for maintaining samples.)
 - (3) Preferably metal for sanitary reasons, but other materials may be used.
 - (4) Equipped with padlocks with keys issued only to official personnel. Under no circumstances shall keys to cabinets or locked cans be accessible to unauthorized persons. A key accountability record shall be maintained to ensure that the assignment of keys is to official personnel only.
- d. The cabinets may be supplied by the applicant provided the four criteria above apply.

2.13 SERVICES PERFORMED REPORT, FGIS-992

- a. Form FGIS-992, Services Performed Report, is a three-part carbonized form to be completed by the sampler when sampling, checkweighing, checkcounting, or checkloading commodities.

- (1) The form is designed so that all pertinent information may be recorded.
 - (2) Field offices may require additional information on this form.
 - (3) All information placed on the form must be factual.
 - (4) A warning statement is included to indicate the penalty for reporting or recording false information (see attachment for completion instructions).
- b. The sampler shall distribute copies of the form as follows:
- (1) Submit the original to the field office.
 - (2) Attach the first copy to the sample sent to the testing laboratory.
 - (3) Retain the second copy.
 - (4) A photocopy may be provided to the applicant at their request and expense.

2.14 RESERVE SAMPLES

- a. Reserve samples are to be kept at the plant or field office for each sample sent to the testing laboratory until laboratory results are received.
- b. Reserve samples are only used for testing purposes when the sample sent to the testing laboratory is lost or damaged in the mail or the laboratory requests the sample.

2.15 FILE SAMPLES

- a. File samples are obtained from the subsample sent to the laboratory and used for retest inspections and file sample appeal inspections.
- b. All file samples, except noncomposite DPSC file samples, will be retained by the testing laboratory.

- c. Do not use the reserve sample as a file sample unless approved by the laboratory.

2.16 REPLACING CONTAINERS AFTER SAMPLING

- a. FGIS is not obligated to purchase samples of products taken for inspection purposes.
 - (1) After samples have been taken from a lot offered for inspection, the applicant must replace the package or unit of quantity in the lot.
 - (2) If the applicant does not replace the quantity of the commodity removed by the sample, certificate only the amount actually present in the lot after sampling.
- b. When an applicant produces extra containers for replacing containers damaged by sampling or handling and the extra containers are not needed, the applicant may ship the unused containers in any subsequent lot. The applicant must make the extra containers accessible for inspection with the subsequent lot.

FGIS-992, SERVICES PERFORMED REPORT

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- 1 Field office performing the service.
- 2 Type of sample, check one; or specify if you check "other."
- 3 Contract number assigned by the contracting party when applicable. Include prefix characters as part of the contract number.
- 4 Sample or lot number assigned. Field offices shall specify one range of lot numbers for each commodity location (mill point). This range shall be large enough to accommodate the maximum number of lots inspected at that commodity location under any one contract. Each range must begin with a number which ends with the digit 1 (e.g., 501-1000; 2501-3000; 1-350). Lot numbers must be numeric and cannot exceed 4 digits in length. Each lot will have its own number (e.g., 501; 502; 503; etc.). To identify new original inspections, either reserve the first digit of the four digit lot code number for this purpose or use the next available lot number for each contract. Julian date codes may be used for DPSC lots.
- 5 Date sampled.
- 6 Commodity code (see reverse side of form for codes, or contact the testing laboratory for codes not listed).
- 7 Location code from the list of numbers provided to the field office.
- 8 Applicant number derived by using the last six numbers of the NFC applicant number.
- 9 Name and address of applicant.
- 10 Type of commodity and whether domestic or export.
- 11 Location of commodity if other than the applicant's address. If same as 9, show "Same."
- 12 Car number, license number, or other identification of the carrier.

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- 13 Record the seal numbers applied and/or broken. If space is not adequate, show "See Below" and place in blocks **16** or **36** .
- 14 Inspection point code. (Supervision or monitoring samples only.) Use codes provided in FGIS Program Directive 929.15, Specified Service Point Codes.
- 15 Destination if known. When submitting ethylene dibromide residue testing and aflatoxin survey samples, use the destination codes provided in Grain Inspection Handbook, Book IV, Chapter 4, Data Collection Forms, Report of Grain Inspected and Weighed for Export, Form FGIS-938.
- 16 Number of containers and complete description of kind of containers (the descriptive terms should be those used in the announcements and specifications). Record checkloading information, such as tally or description, of how count was made. When submitting supervision samples, include the type of test performed and the original results obtained. When forwarding submitted samples, state the applicant's testing request. Also, include any necessary laboratory instructions.
- 17 The gross weight of each container weighed. Refer to the checkweighing instructions to determine the number of containers to weigh. When not recording in pounds, indicate the unit of weight used.
- 18 Unless the lot obviously meets net weight, record the total gross weight of the containers weighed by totaling the results in **17** above.
- 19 The weight of the empty outer containers weighed. Refer to the checkweighing instructions for the number of containers to weigh. When not recording in pounds, indicate the unit of weight used.
- 20 The total weight of the empty outer containers weighed by totaling the results in **19** above.

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- 21 The weight of empty inner containers weighed, if present. Refer to the checkweighing instructions for the number of containers to weigh. When not recording in pounds, indicate the unit of weight used.
- 22 The total weight of the empty inner containers, if present, by totaling the results in 21 above.
- 23 Unless the lot obviously meets net weight, record the average gross weight of the filled containers, by dividing the results in 18 by the number of containers weighed.
- 24 Unless the lot obviously meets net weight, record the average tare weight of the empty containers.
- 25 Unless the lot obviously meets net weight, record the average net weight of the containers by subtracting the result in 24 from that in 23.
- 26 Unless the lot obviously meets net weight, record the estimated gross weight of the lot by multiplying the number of containers in the lot by the result in 23.
- 27 Unless the lot obviously meets net weight, record the estimated tare weight of the lot by multiplying the number of containers in the lot by the result in 24.
- 28 Unless the lot obviously meets net weight, record the estimated weight of the lot by multiplying the number of containers in the lot by the intended container net weight. If the lot does not meet net weight, record the estimated net weight of the lot by subtracting the result in 27 from that in 26.
- 29 The name of the sampler(s).
- 30 Date services were performed.
- 31 Starting time to the nearest 1/4 hour.

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- 32 Stopping time to the nearest 1/4 hour.
- 33 The total hours for each period of time recorded. If more than one lot is worked simultaneously, prepare an FGIS-992 form for each. Record the time worked on each form; however, do not attempt to prorate and divide the time between different lots.
- Place an asterisk by the hours worked and, under "comments of sampler," identify the other lots worked simultaneously. When billing, field office personnel shall divide the time equally between the lots worked simultaneously or use the following method to prorate the time worked on each lot.
- a. Total the hours worked on each lot individually during a 1-day (24 hour) period.
 - b. Total the hours worked on all lots during a 1-day (24 hour) period.
 - c. Divide the hours worked on each individual lot by the total hours worked on all lots.
 - d. Multiply this amount by the actual clock hours worked for the day (24 hours) and round to the nearest 1/4 hour.
- 34 The type of service performed (abbreviations are acceptable; i.e., s-sampling, c-condition, cw-checkweighing, cc-checkcount, sb-stand by, etc.).
- 35 The total hours worked.
- 36 Special services, unusual conditions, events, or observations concerning the lot. When necessary, give an explanation of the time recorded when other lots are worked simultaneously or condition of the carrier when found to be unfit to maintain the quality of the product.
- 37 Signatures of all persons performing services.

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- 38 Time and date samples were mailed.
- 39 Time and date the field office received the results from the testing laboratory.
- 40 Time and date the results were called to the vendor.
- 41 The date the certificate was mailed.